AMENDMENTS TO THE CLAIMS

Claims 1-12 (Cancelled).

Claim 13 (Currently Amended) A method for reducing intergranular degradation of lead or lead alloy which comprises recrystallizing said lead or lead alloy to produce a percentage of special grain boundaries which is at least 20% of the total grain boundaries of said lead or lead alloy; said recrystallization being effected by subjecting said lead or lead alloy to at least one cycle having the sequential steps of:

a) deforming at least a portion of a mass of said lead or lead alloy while maintaining said mass at a temperature ~~which is above room temperature~~ up to the solvus temperature of said lead or lead alloy, optionally quenching said mass;

b) annealing said mass of lead or lead alloy at a temperature between ~~150°C~~ 100°C and the melting point of said lead or lead alloy for a time sufficient to effect recrystallization of said lead or lead alloy;

c) optionally repeating steps a) and b);

said alloy being lead alloyed with at least one element selected from the group consisting of Ag, Al, As, Ba, Bi, Ca, Cd, Cu, Fe, Li, Mg, Na, Se, Sb, Sn, Sr, and Zn.

Claim 14 (New) The method of claim 1 wherein said mass of lead or lead alloy which is subjected to said at least one cycle is a current collector in the form of a book mold grid, a tubular grid, a foil, a sheet, a perforated strip, a continuous cast strip, a continuous cast grid rolled to its final dimensions, a connector or a consumable electrode for use in an electrochemical cell.

Claim 15 (New) The method of claim 14 wherein said deforming takes place by rolling, expanding, punching, bending or peening said mass of lead or lead alloy.

Claim 16 (New) The method of claim 13 wherein said mass of lead or lead alloy is recrystallized to produce a percentage of special grain boundaries which is greater than 50% of the total grain boundaries of said lead or lead alloy.

Claim 17 (New) The method of claim 13 wherein said deforming takes place within a temperature range which is 15°C up to the solvus temperature of said lead or lead alloy.

Claim 18 (New) The method of claim 17 wherein said deforming takes place at a temperature in the range of 40°C to 95°C.

Claim 19 (New) The method of claim 15 wherein said deforming takes place by rolling, bending or peening.

Claim 20 (New) The method of claim 19 wherein said deforming takes place by peening.

Claim 21 (New) A method for reducing intergranular degradation of lead or lead alloy which comprises recrystallizing said lead or lead alloy to produce a percentage of special grain boundaries which is at least 40% of the total grain boundaries of said lead or lead alloy; said recrystallization being effected by subjecting a cast billet of lead or lead alloy to at least one cycle having the sequential steps of:

a) extruding said billet to a strip of desired thickness while maintaining the strip at a temperature up to the solvus temperature of said lead or lead alloy, optionally quenching the strip;

b) optionally deforming the strip by rolling, expanding, punching, bending or peening to a desired thickness while maintaining the strip at a temperature up to the solvus temperature of said lead or lead alloy, optionally quenching the strip;

c) annealing the lead or lead alloy strip at a temperature between 150°C and the melting point of the alloy for a time sufficient to effect recrystallization of the lead or

lead alloy;

said lead alloy being lead alloyed with at least one element selected from the group consisting of Ag, Sn, Cu, Zn, As, Bi, Li, Na, Al, Mg, Ca, Sr, Ba, Cd, Fe, Se, and Sb.

Claim 22 (New) The method of claim 21 wherein said strip is deformed in step b).

Claim 23 (New) The method of claim 22 wherein said recrystallization of said lead or lead alloy produces a percentage of special grain boundaries which is greater than 50% of the total grain boundaries of said lead or lead alloy.

Claim 24 (New) The method of claim 22 wherein said steps a) and/or b) takes place within a temperature range which is 15°C up to the solvus temperature of said lead or lead alloy.

Claim 25 (New) The method of claim 24 wherein steps a) and/or b) takes place within a temperature range which is 40°C to 95°C.

Claim 26 (New) The method of claim 22 wherein said strip is deformed in step b) by rolling, bending or peening.

Claim 27 (New) The method of claim 26 wherein said strip is deformed in step b) by peening.

Claim 28 (New) The method of claim 13 wherein said annealing takes place at a temperature between 150°C and the melting point of said lead or lead alloy.

Claim 29 (New) The method of claim 17 wherein said deforming takes place at a temperature which is more than 15°C up to the solvus temperature of said lead or

lead alloy.

Claim 30 (New) The method of claim 29 wherein said deforming takes place at a temperature which is in the range of 40°C up to the solvus temperature of said lead or lead alloy.

Claim 31 (New) The method of claim 29 wherein said deforming is carried out at a temperature which is the range of 30°C up to 125°C.

Claim 32 (New) The method of claim 29 wherein said deforming takes place at a temperature within the range of 35°C to 200°C.

Claim 33 (New) The method of claim 29 wherein said deforming takes place at a temperature within the range of 40°C to 150°C.

Claim 34 (New) The method of claim 29 wherein said deforming takes place at a temperature which is within the range of 60°C to 125°C.

Claim 35 (New) The method of claim 13 wherein said lead alloy is deformed by about 1%-99% in step a) and said lead alloy is annealed in step b) within the temperature range of 100°C-325°C for one second to 360 minutes.

Claim 36 (New) The method of claim 35 wherein said lead alloy is annealed in step b) for five seconds to 360 minutes.

Claim 37 (New) The method of claim 13 wherein substantially pure lead is deformed in the range of 1%-70% in step a) and said substantially pure lead is annealed in step b) within the temperature range of 150°C to 325°C for five seconds to 36 minutes to thereby produce substantially pure lead which has a percentage of special grain boundaries which is greater than 50% of the total grain boundaries of said

substantially pure lead.

Claim 38 (New) A method for reducing intergranular degradation of lead alloy which comprises recrystallizing said lead alloy to produce a percentage of special grain boundaries which is greater than 50% of the total grain boundaries of said lead alloy; said recrystallization being effected by subjecting said mass of lead alloy to a single cycle of deformation between 10% and 40% while maintaining said mass at a temperature up to the solvus temperature of said lead alloy followed by recrystallization of said lead alloy by annealing at a temperature between 200°C and 280°C for a time which is in the range of 10 seconds to 10 minutes followed by cooling to ambient temperature;

said alloy being a Pb-X-Y alloy wherein X is at least one metal selected from the group consisting of Li, Na, K, Rb, Cs, Fr, Be, Mg, Ca, Sr, Ba and Sb and Y is at least one metal selected from the group consisting of Ag, Sn, Cu, Zn, As and Bi;

with the proviso that the cumulative concentration of X is less than 0.05 weight percent and the cumulative concentration of Y is in the range of 0.5 to 5 weight percent.

Claim 39 (New) A method for reducing intergranular degradation of lead alloy which comprises recrystallizing said lead alloy to produce a percentage of special grain boundaries which is greater than 50% of the total grain boundaries of said lead alloy; said recrystallization being effected by subjecting said mass of lead alloy to at least two cycles having the sequential steps of:

a) deforming at least a portion of said mass of lead alloy to produce a deformation between 40%-80% while maintaining said mass at a temperature up to the solvus temperature of said alloy;

b) annealing said mass of lead alloy at a temperature between 200°C and 280°C for a time which is in the range of 10 seconds to 10 minutes to effect recrystallization of said lead alloy;

and then, after completing said at least two cycles, cooling said lead alloy to ambient temperature;

said lead alloy being a Pb-X-Y alloy wherein X is at least one metal selected from the group consisting of Li, Na, K, Rb, Cs, Fr, Be, Mg, Ca, Sr, Ba and Sb and Y is at least one metal selected from the group consisting of Ag, Sn, Cu, Zn, As, and Bi;

with the proviso that the cumulative concentration of X is greater than or equal to 0.05 weight percent and the cumulative concentration of Y is in the range of 0.5 to 5 weight percent.

Claim 40 (New) The method of claim 13 wherein a mass of substantially pure lead in the form of a cast strip is deformed in step a) by rolling said strip in a rolling mill at room temperature to produce a 20% reduction in thickness; said substantially pure lead is annealed in step b) at a temperature of 160°C for 15 minutes; and

said strip is subjected to six of the cycles.

Claim 41 (New) The method of claim 13 wherein a mass of lead alloy in the form of a strip is deformed in step a) by cold rolling at room temperature to achieve a 40% reduction in thickness, said lead alloy consisting of 0.073 weight percent Ca, 0.7 weight percent Sn with the balance being Pb;

said lead alloy is annealed in step b) at a temperature of 270°C for 10 minutes;

the number of cycles is 3; and

said lead alloy is cooled to ambient temperature after completing said three cycles.

Claim 42 (New) The method of claim 13 wherein a mass of lead alloy in the form of a strip is deformed in step a) by cold rolling at room temperature to achieve a 40% reduction in thickness, said lead alloy consisting of 0.065 weight percent Ca, 0.7 weight percent Sn and 0.03 weight percent Ag with the balance being Pb;

said lead alloy is annealed in step b) at 250°C for 10 minutes;

the number of cycles is 2; and

said lead alloy is cooled to ambient temperature after completing said two cycles.

Claim 43 (New) The method of claim 13 wherein a mass of lead alloy in the form of a strip is deformed in step a) by cold rolling at room temperature to achieve a 40% reduction in thickness, said lead alloy consisting of 0.073 weight percent Ca, 1.4 weight percent Sn with the balance being Pb;

said lead alloy is annealed in step b) at 250°C for 10 minutes;

the number of cycles is 2; and

said lead alloy is cooled to ambient temperature after completing said two cycles.

Claim 44 (New) A method for reducing intergranular degradation of a lead alloy which consists of 0.03 weight percent Ca, 0.7 weight percent Sn, 0.06 weight percent Ag, with the balance being Pb, said method comprising the steps of casting a strip of said alloy having a thickness of 0.86-0.89mm; subjecting said strip to a single processing cycle comprised of about 20% cold tensile strain at room temperature; and then heat treating said alloy at a temperature of 250°C for five minutes followed by cooling to ambient temperature.